

What is claimed is:

See  
B17

1. An actuator for a window lift mechanism, said actuator comprising:  
an output shaft for driving said mechanism;  
an output gear coupled to said output shaft; and  
a plurality of motors ~~coupled to said output gear for driving said output gear~~  
~~and said output shaft.~~
2. An actuator according to claim 1, wherein each of said motors is coupled to  
said output gear by an associated gear train.
3. An actuator according to claim 2, wherein a first one of said gear trains  
comprises a worm gear in meshing engagement with said output gear, said  
worm gear resisting back-drive of said output shaft.
4. An actuator according to claim 3, wherein a second one of said gear trains  
comprises a spur gear in meshing engagement with said output gear.
5. An actuator according to claim 1, wherein said output gear comprises a spur  
gear.

097589-011904

6. An actuator according to claim 1, wherein said output gear comprises a face gear
7. An actuator according to claim 2, wherein said output gear comprises a first spur gear, and wherein a first one of said gear trains comprises a worm gear in meshing engagement with said output gear and a second one of said gear trains comprises a second spur gear in meshing engagement with said first spur gear.
8. An actuator according to claim 1, wherein said output gear comprises a sun gear of a planetary gear system, and wherein said motors are coupled to said sun gear through a ring gear and planet gears of said planetary gear system.
9. An actuator according to claim 8, wherein each of said motors is coupled to said sun gear by an associated gear train.
10. An actuator according to claim 9, wherein a first one of said gear trains comprises a worm gear in meshing engagement with said sun gear, said worm gear resisting back-drive of said output shaft.
11. An actuator according to claim 10, wherein a second one of said gear trains comprises a spur gear in meshing engagement with said output gear.

12. An actuator according to claim 1, said actuator further comprising a control circuit coupled to said motors for independently energizing said motors.
13. An actuator according to claim 1, said actuator further comprising a solenoid having a plunger normally extending into one of a plurality of slots in said output gear, wherein said solenoid is configured to retract said plunger from said one of said slots when said motors are energized for driving said output gear.
14. A window lift mechanism comprising:
  - a dual rack assembly having first and second opposed racks;
  - first and second pinions in meshing engagement with said first and second racks, respectively; and
  - an actuator assembly comprising a plurality of motors for driving said first and second pinions along said first and second racks.
15. A window lift mechanism according to claim 14, wherein said first pinion is in meshing engagement with said second pinion, and wherein said actuator assembly comprises an output shaft coupled to an output gear and said first

pinion, and wherein each of said motors is coupled through an associated gear train to drive said output gear and said first pinion.

16. A window lift mechanism according to claim 15, wherein a first one of said gear trains comprises a worm gear, said worm gear resisting back-drive of said output shaft.

17. A window lift mechanism according to claim 15, wherein said output gear comprises a spur gear.

18. A window lift mechanism according to claim 14, wherein said actuator comprises a housing having first and second arms, each of said arms having a portion slidably disposed in an associated groove in an associated one of said first and second racks, whereby said actuator translates along said racks with translation of said pinions along said racks.

19. A window lift mechanism according to claim 14, wherein said actuator comprises first and second ones of said motors, and wherein said first motor is coupled to said first pinion through a first gear train comprising a first worm gear in meshing engagement with said first pinion, and wherein said second motor is coupled to said second pinion through a second gear train

comprising a second worm gear in meshing engagement with said second pinion.

20. A window lift mechanism according to claim 16, wherein a second one of said gear trains comprises a spur gear in meshing engagement with said output gear.

21. A window lift mechanism according to claim 14, wherein said actuator further comprises a control circuit coupled to said motors for independently energizing said motors.

22. A window lift mechanism according to claim 14, wherein said actuator further comprises a solenoid having a plunger normally extending into one of a plurality of slots in said output gear, wherein said solenoid is configured to retract said plunger from said one of said slots when said motors are energized for driving said output gear.

23. A clutch comprising:  
an output gear and an input gear concentric with said output gear, said output gear having at least one notch at a perimeter thereof for receiving an associated tab on an interior surface of said input gear, said interior surface of said input gear further comprising a locking pawl notch; and

first and second locking pawls, said locking pawls being joined by a spring and disposed at opposite ends of said locking pawl notch adjacent said perimeter of said output gear, wherein upon rotation of said input gear said tab engages said at least one notch to rotate said output gear in a first direction, and wherein upon rotation of said output gear in a second direction opposite to said first direction said locking pawls engage said output gear to resist rotation of said output gear.

24. A clutch according to claim 23, wherein said output gear comprises a face gear.

25. A clutch comprising:

a carrier disposed on an output shaft; and

a plurality of cams, each of said cams being pivotally coupled to said carrier and having an end positioned adjacent a cam engaging surface,

wherein upon application of a rotational force to said output shaft in a first direction said cams pivot relative to said carrier to allow rotation of said output shaft, and wherein upon application of a rotational force to said output shaft in a back-drive direction said cams pivot relative to said carrier to engage said cam engaging surface to resist rotation of said output shaft.

26. A clutch according to claim 25, wherein said cam engaging surface comprises an interior surface of an input gear coupled to said output shaft.
27. A clutch according to claim 26, wherein said input gear comprises a face gear.
28. A clutch according to claim 25, wherein said cam engaging surface comprises an interior surface of a mounting opening for said clutch.
29. A clutch according to claim 25, wherein each of said cams is coupled to said carrier by a pivot pin.
30. A clutch according to claim 29, wherein each of said cams is coupled to said carrier by a spring.
31. A actuator comprising:
  - a flexible carrier assembly;
  - a gear train coupled to said flexible carrier assembly, said gear train comprising a worm gear coupled to a worm wheel;
  - an input gear train comprising a first spur gear in meshing engagement with said worm wheel;

an output gear train comprising a second spur gear in meshing engagement with said worm gear; and

at least one motor for driving said input gear train,

wherein upon application of a linear force to an output gear of said output gear train, said flexible carrier assembly flexes to substantially prevent said linear force from coupling to said input gear train.

32. An actuator according to claim 31, wherein said carrier assembly comprises first and second flexible arms, and wherein said gear train is disposed between said first and second arms.

09765099-011801